

## Patent claims:

1. Coupled enzymatic reaction system comprising a cofactor-dependent enzymatic transformation of an organic compound and an enzymatic regeneration of the cofactor in a purely aqueous solvent system without addition of surfactant, wherein the substrate is employed in the enzymatic transformation in an amount of at least 50 mM per litre of water, as long as this does not fall below the solubility limit of the substrate.
2. Reaction system according to claim 1, characterized in that an emulsion or a suspension is present in the reaction system at least initially.
- 15 3. Reaction system according to one or more of the preceding claims, characterized in that the substrate concentration is at least initially 50 to 1,500 mM, preferably 100 to 1,000 mM, and very 20 preferably 100 to 500 mM per litre of water, as long as this does not fall below the solubility limit of the substrate.
- 25 4. Reaction system according to one or more of the preceding claims, characterized in that a carbonyl compound, in particular an aldehyde or an unsymmetric ketone, is employed as the substrate.
- 30 5. Reaction system according to one or more of the preceding claims, characterized in that an alcohol compound, in particular a primary or a chiral secondary alcohol, is employed as the substrate.

6. Reaction system according to one or more of the preceding claims,  
characterized in that  
NADH or NADPH is employed as the cofactor.
- 5 7. Reaction system according to one or more of the preceding claims,  
characterized in that  
the reaction is carried out at temperatures of 10 to  
80°C, preferably 20 to 60°C, and very particularly  
10 preferably 20 to 40°C.
8. Reaction system according to one or more of the preceding claims,  
characterized in that  
a dehydrogenase is employed as the enzyme for the  
15 transformation of the organic compound.
9. Reaction system according to claim 8,  
characterized in that  
an alcohol dehydrogenase is employed.
10. Reaction system according to one or more of the  
20 preceding claims,  
characterized in that  
the regeneration of the cofactor takes place by means  
of a formate dehydrogenase, in particular a formate  
dehydrogenase from *Candida boidinii*.
- 25 11. Process for the preparation of organic compounds,  
characterized in that  
a reaction system according to one or more of the  
preceding claims is used.
12. Process according to claim 11,  
30 characterized in that  
the reaction mixture is separated into an aqueous and  
an organic phase, if appropriate by addition of an

organic solvent, and the desired product is isolated from the organic phase.

13. Use of the reaction system according to claim 1 for the enzymatic transformation of organic compounds or  
5 for diagnosis or analysis.
14. Use according to claim 13 in a process for the preparation of enantiomerically enriched organic compounds.